



THE VHF/UHF N A R R O W B A N D M A N D A T E

It's Closer Than You Think!

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In November 1992, the FCC released Docket 92-235, Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them. This was the beginning of the refarming, or narrowbanding, effort.

In the beginning, *refarming* was the term most frequently used, but *narrowbanding* is the term now in general use. Narrowbanding is one method the FCC has adopted by rule to promote more efficient use of the VHF 150–174 MHz and 450–512 MHz radio spectrum used by public safety and business and industry. The Narrowbanding Docket is the Commission's response to public safety's request for additional spectrum in the bands below 512 MHz.

This is not the first time the FCC has split channels to create new spectrum, and it probably won't be the last time. As more spectrum is needed and digital technologies advance, voice channels will be squeezed into smaller and smaller amounts of bandwidth. Eventually, a greater degree of access will be made available to the same amount of spectrum currently available to users. This article addresses only the public safety portion of the narrowbanding issue.

A simple definition of narrowbanding: A way to make two radio frequencies out of one radio frequency. The frequency is not cut in half. Rather, the middle of the frequency is left in place, and the lower and upper sides of the frequency are cut away to create new radio frequencies when added to the lower or upper side of the adjacent frequency. For example, 155.985, 156.000 and 156.015 become 155.985, 155.9925, 156.000, 156.0075 and 156.015 with narrowband frequencies inserted. A UHF channel example would be that 453.475, 453.500 and 453.525 become 453.475, 453.48750, 453.500, 453.51250 and 453.5250.

VHF channels are spaced at 7.5-kHz separation, and the UHF channels are at 12.5-kHz separation. The old frequencies, such as 156.000 or 453.500, can be used as either narrowband or wideband, but wideband emission will be allowed only for a few more years.

In December 2004, in Docket 99-87, Third Memorandum Opinion and Order, Third Further Notice of Proposed Rule Making and Order, and the March 2005 Report and Order 05-69, the FCC set forth specific deadlines to meet for narrowband radio systems. The first deadline took effect

Jan. 1, 2005, and the final deadline is not until 2013. But don't let the 2013 deadline for all radio systems to be narrowband-compliant fool you. A deadline that affects your operations may be closer than you realize—or even have passed you by.

TIMELINE

The timeline for the *refarming* or narrowbanding process stretches from 1992–2013.

1992: 92-235, Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services was the original proposal. Part 88 never happened, but the Part 90 rules have been amended.

1995: Report and Order and Further Notice of Rulemaking, 92-235, adopted rules for more spectrum efficiency and promoted newer technologies.

1997: The FCC begins accepting applications for narrowband channels.

February 2003: The Second Report and Order and Second Further Notice of Proposed Rule Making prohibited applications for new wideband (20K0F3E) systems, modifications to existing wideband systems and the manufacture, import or certification of wideband radio equipment, and set date-certain deadlines of 2013 for business/industrial users and 2018 for public safety users.

Dec. 3, 2003: The FCC issues an Order to stay the Narrowband Ruling implementation date of Jan. 13, 2004, pending resolution of the petitions for reconsideration of the Second Report and Order.

2004: 04-243, Amendment of Parts 2 and 90 of the Commission's Rules to Provide for Narrowband Private Land Mobile Radio Channels in the 150.05–150.8 MHz, 162–174 MHz, and 406.1–420 MHz Bands that are Allocated for Federal Government Use was a proposal to limit the usage of 150.775, 150.78250, 150.790 and 150.79750.

04-292, Third Memorandum Opinion and Order (3rd MO&O), Third Further Notice of Rule Making and Order (3rd FNPRM), December 2004 (WT Docket 99-87), lifted the stay and set date-certain deadlines of January 2011 to accept applications for wideband applications and January 2013 for public safety and business/industrial users to migrate to narrowband.

Jan. 1, 2005: VHF/UHF narrowband interoperability channels (see Table 1, p. 88) become primary usage, and adjacent chan-

NARROWBAND MANDATE

nels are now secondary usage if they are still wideband emission, such as 20K0F3E, or as the Commission states, “utilizing emissions wider than 11K per voice path on these channels.” Existing users on interoperability channels are now secondary to interoperability usage. *Secondary* usage means you have no interference protection and could be required to cease operation if you interfere with interoperability operations. It could also mean that if you continue to operate a wideband system adjacent to the interoperability channel and another entity wants your frequency and will operate in a narrowband configuration, it could possibly license on top of you.

March 2005: 04-243, Amendment of Parts 2 and 90 of the Commission’s Rules to Provide for Narrowband Private Land Mobile Radio Channels in the 150.05–150.8 MHz, 162–174 MHz, and

Table 1: Interoperability & Adjacent Channels		
Adjacent Channel	Interop Channel	Adjacent Channel
151.13000	151.13750	151.14500
154.44500	154.45250	154.45625
155.74500	155.75250	155.76000
158.73000	158.73750	158.74500
159.46500	159.47250	159.48000

406.1–420 MHz Bands That Are Allocated for Federal Government Use limited effective radiated power for 150.775 and 150.790 to 100 watts, limited use of those channels to medical operations only, and set a deadline for wideband applications to be accepted only until Jan. 1, 2008. The amendment determined applications for 150.78250 and 150.79750 will no longer be accepted and disallowed airborne usage of 150.775–150.79750.

Jan. 1, 2008: New operations on 150.775 and 150.790 will be limited to narrowband only. Existing wideband may continue until Jan. 1, 2013.

2011: As of Jan. 1, no applications for wideband (20K0F3E) licenses will be accepted.

Manufacture and importation of any 150–174 MHz and 421–512 MHz band equipment operating on a channel bandwidth up to 25 kHz will be permitted until Jan. 1, 2011. After Jan. 1, 2011, manufacture and importation of any 150–174 MHz and 421–512 MHz band equipment operating on a channel bandwidth greater than 12.5 kHz will be accepted only to the extent that the equipment meets the spectrum efficiency standard of one channel per 12.5 kHz of channel bandwidth (voice) or 4800 bits per second per 6.25 kHz (data).

2013: Jan. 1, all public safety radio systems must be narrowband compliant. Specific, dedicated paging-only channels may remain wideband.

SO WHAT’S A PUBLIC SAFETY AGENCY TO DO?

Don’t purchase any VHF/UHF radio equipment that is not FCC-narrowband-compliant. Narrowband-compliant equipment must be able to transmit at 2.5-kHz deviation and program all narrowband channels, including anomalies, such as 151.24250 MHz and 154.45250 MHz, that don’t result in a whole number when divided by 6.25 kHz or 7.5 kHz.

Review your FCC radio license. See if you need to be narrowband already (e.g., if you’re using a frequency that is adjacent to an interoperability channel). If you’re using a designated inter-

operability channel as a primary dispatch channel, plan to relocate to a channel that is not an interoperability channel. The VHF/UHF interoperability channels will be effective only if those adjacent go narrowband and those on the same frequency vacate so that they can be available for interoperability usage.

Inventory your current radio equipment to see what radios (e.g., portables, mobiles, control stations, base stations, repeaters, data/SCADA/telemetry/siren control radios) are narrowband-compliant and FCC-type accepted. *Caution:* Some early narrowband radios won’t work on all narrowband frequencies. Make sure your radios *will* actually work on all narrowband frequencies.

For radio equipment that is not already FCC-narrowband-compliant, start getting cost estimates to replace the equipment and requesting replacement in the next budget. If it will take several years, time is running out.

Make sure your FCC radio license is current, with correct contact information, emissions and construction/build-out and FCC-required notifications. Moving from wideband to narrowband must go through frequency coordination, even if you’re not changing frequencies. If modifying your license, add the narrowband emission to promote a narrowband migration path for your agency.

If applying for a new frequency, go ahead and implement the system as a narrowband system to avoid the need to change later.

Use this FCC mandate as a chance to improve your system and replace old equipment.

When purchasing new VHF/UHF radio equipment, make sure it’s FCC-type-accepted for narrowband usage. Look for emission designation 11K0F3E (voice) or 11K0F1D, 11K0F2D for data. Data usage will need to meet a data rate of 9.6 KBPS for a 6.25-kHz channel or 19.2 KBPS for a 12.5-kHz narrowband channel.

Take this opportunity to begin to utilize the VHF/UHF interoperability channels. Check with your local or state interoperability committee to obtain usage policies, standardized channel names and memoranda of understanding (MOU).

Be aware of the ripple effect. If another agency you communicate with goes narrowband and you want to keep their channel in your radio to talk to them, then you must be narrowband compliant.

Ask your state agencies and leaders when 155.475 MHz (the National Law Enforcement Emergency Channel) will go narrowband, as well as the fire mutual aid channels 154.265 MHz, 154.280 MHz and 154.295 MHz. They may change sooner than 2011 or 2013, and the process needs to be a coordinated effort.

Although 2011 or 2013 seem like a long time away, consider that most agencies are now working on their 2008 budgets. If it will take you multiple years to migrate to narrowband, you may already be behind.

Back in 1992, the same year narrowband was first introduced, I intended to plant shade trees at our new home. Now, 15 years later, I think we’ll stay put. So when was the best time to plant trees? Fifteen years ago. The *next* best time to plant trees is today. Narrowband compliance is coming, so don’t put it off. The deadlines will be here before you know it, if they haven’t already passed you by! **||PSC||**

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